

CLAIMS:

1. A control unit controlling a threshold voltage of a circuit unit having a plurality of transistor devices, comprising
 - a reference circuit;
 - a measuring unit measuring a threshold voltage of at least one sensing
 - 5 transistor of the circuit unit and measuring a reference threshold voltage of at least one reference transistor of the reference circuit;
 - a differential voltage generator generating a differential voltage from outputs of the measuring unit and
 - a bulk connection of the transistor devices in the circuit unit to which the
 - 10 differential voltage is fed as a biasing voltage.
2. The control unit of claim 1, wherein the differential voltage generator comprises:
 - an averaging unit forming at least one average threshold voltage value of at
 - 15 least one measured transistor threshold voltage of the circuit unit;
 - a comparing unit comparing at least one average threshold voltage value of the circuit unit with at least one measured transistor threshold voltage of the reference circuit and creating at least one difference voltage value indicating the difference between at least one
 - 20 average threshold voltage value of the circuit unit and at least one transistor threshold voltage of the reference circuit;
 - an amplifier unit amplifying at least one difference voltage value of the comparing unit and creating at least one amplified difference voltage value.
- 25 3. The control unit of claim 2, wherein the amplifier unit is a high gain amplifier.
4. The control unit of claim 1, wherein the reference circuit comprises at least one reference transistor in at least one comparator amplifier.

5. The control unit of claim 4, wherein the reference transistor is provided in a separate well of the chip comprising the circuit unit.

6. The control unit of claim 4, wherein the reference transistor is controlled separately from the transistor devices of the circuit unit by a reference voltage.

7. The control unit of claim 1, wherein the measuring unit comprises at least one sensing transistor sensing the threshold voltage.

8. The control unit of claim 8, wherein the sensing transistor is controlled separately from the reference transistor by a sensing voltage.

9. The control unit of claim 1, wherein the circuit unit comprises a plurality of transistor devices, and wherein a first sub-plurality of the transistor devices is employed as reference transistors and a second sub-plurality of the transistor devices is employed as sensing transistors, and wherein the differential output of the differential voltage generator is fed as a biasing voltage to the bulk of the plurality of transistor devices.

10. An integrated circuit (IC) device comprising a circuit unit and a control unit according to claim 1.

11. A method for controlling of at least one threshold voltage of transistors in a circuit unit comprising:

measuring at least one transistor threshold voltage of the circuit unit;
providing at least one reference transistor and measuring a threshold voltage of the at least one reference transistor;
generating a differential voltage from outputs of the measuring unit and
feeding the differential voltage as a biasing voltage to a bulk connection of the transistor devices in the circuit unit.

12. The method of claim 11, wherein the generating step comprises:
forming at least one average threshold voltage value of at least one measured transistor threshold voltage of the circuit unit;

comparing at least one average threshold voltage value of the circuit unit with at least one measured transistor threshold voltage of the reference circuit and creating at least one difference voltage representing the difference between at least one average threshold voltage value of the circuit unit and at least one transistor threshold voltage of at least one

5 reference transistor; and

amplifying the at least one difference voltage of the comparing unit and creating at least one amplified difference voltage.

13. The method of claim 11 or 12, wherein

10 a plurality of transistor devices is divided up into a first sub-plurality of reference transistors and a second sub-plurality of sensing transistors and wherein

the transistor threshold voltage of the first sub-plurality is measured as reference voltage;

15 the threshold voltage of the second sub-plurality is measured as sensing voltage;

a differential voltage is generated from the reference voltage and the sensing voltage and wherein

the differential voltage is input to the bulk of the plurality of transistor devices.

20 14. The method of claim 11, wherein the controlling of at least one threshold voltage of transistors in a circuit unit is done in a closed loop.

15. The method of claim 14, wherein the controlling in the closed loop includes a controlling of a power supply.

25

16. The method of claim 12, wherein the amplified average voltage is negatively fed back to the circuit unit for reducing the threshold voltage difference between the circuit unit and the reference circuit.

30 17. The method of claim 11, wherein the threshold voltage is directly measured.